

# Intelligent Solutions for Sustainable Power Grids

Part of the Advances in Computer and Electrical Engineering Book Series

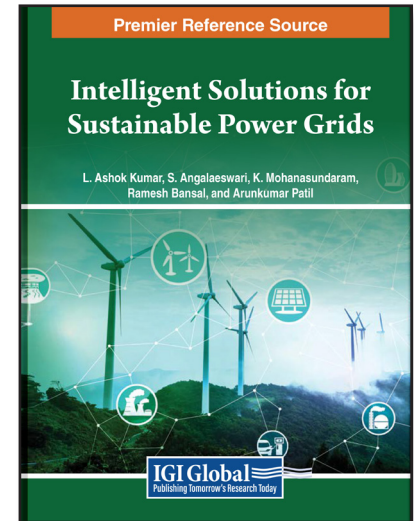
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## Description:

In the environment of energy systems, the effective utilization of both conventional and renewable sources poses a major challenge. The integration of microgrid systems, crucial for harnessing energy from distributed sources, demands intricate solutions due to the inherent intermittency of these sources. Academic scholars engaged in power system research find themselves at the forefront of addressing issues such as energy source estimation, coordination in dynamic environments, and the effective utilization of artificial intelligence (AI) techniques.

Power systems grapple with the intermittent nature of renewable energy sources, necessitating advanced forecasting techniques and effective energy management. The coordination among distributed elements, smooth power transfer, and the optimization of power systems remain persistent challenges. Additionally, the competitive nature of distributed networks, coupled with the need for economic considerations, poses hurdles for young researchers entering the field. There is a pressing need for comprehensive insights into these challenges, coupled with practical solutions that leverage emerging technologies.

**Intelligent Solutions for Sustainable Power Grids** focuses on emerging research areas, this book addresses the uncertainty of renewable energy sources, employs state-of-the-art forecasting techniques, and explores the application of AI techniques for enhanced power system operations. From economic aspects to the digitalization of power systems, the book provides a holistic approach. Tailored for undergraduate and postgraduate students as well as seasoned researchers, it offers a roadmap to navigate the intricate landscape of modern power systems. Dive into a wealth of knowledge encompassing smart energy systems, renewable energy integration, stability analysis of microgrids, power quality enhancement, and much more. This book is not just a guide; it is the solution to the pressing challenges in the dynamic field of energy systems.



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## Topics Covered:

- AI & ML Techniques for Data Analytics
- Battery Storage System and Routing Algorithms
- Cybersecurity in Power System Data
- Energy Management Using AI Techniques
- Energy Prediction
- Optimization Techniques Applied to Power Systems
- Power Quality Enhancement in Hybrid Energy Systems
- Renewable Energy Integration
- Smart Energy Systems
- Stability Analysis of Microgrids

**Subject:** Computer Science & Information Technology

**Classification:** Edited Reference

**Readership Level:** Advanced-Academic Level (Research Recommended)

**Research Suitable for:** Advanced Undergraduate Students; Graduate Students; Researchers; Academicians; Professionals; Practitioners

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